NAMA:______________________________TINGKATAN:__________

SEKOLAH MENENGAH KEBANGSAAN KUHARA TAWAU

PEPERIKSAAN PERCUBAAN SPM 2021

MATEMATIK / MATHEMATICS 1449/1

KERTAS 1/PAPER 1

$1\frac{1}{2}$ jam/*hours* Satu Jam Tiga Puluh Minit/One Hour Thirty Minutes

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JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU
DO NOT OPEN THIS EXAMINATION PAPER UNTIL INSTRUCTED

1. Kertas peperiksaan ini mengandungi 40 soalan objektif.
   This examination paper contains 40 objective questions.

2. Jawab **semua** soalan.
   *Answer **all** questions.*

3. Pilih jawapan dari A, B, C, D dan tandakan hitam di kertas OMR.
   Choose the answer from A, B, C, D and mark it in black on the OMR paper.

4. Semua gambar rajah dalam kertas soalan ini tidak dilukis mengikut skala sebenar kecuali dinyatakan.
   All diagrams in this question paper are not drawn to actual scale unless stated.

5. Anda boleh menggunakan non-programmable scientific calculator.
   You can use a non-programmable scientific calculator.

RUMUS MATEMATIK
MATHEMATICAL FORMULAE

Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.

NOMBOR DAN OPERASI
NUMBERS AND OPERATIONS

1 $a^m \times a^n = a^{m+n}$

2 $a^m \div a^n = a^{m-n}$

3 $(a^m)^n = a^{mn}$

4 $a^{\frac{m}{n}} = (a^m)^{\frac{1}{n}}$

5 Faedah mudah / *Simple interest*, $I = Prt$

6 Faedah kompaun / *Compound interest*, $MV = P\left(1 + \frac{r}{n}\right)^{nt}$

7 Jumlah bayaran balik / *Total repayment*, $A = P + Prt$

PERKAITAN DAN ALGEBRA
RELATIONSHIP AND ALGEBRA

1 Jarak / *Distance* = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

2 Titik tengah / *Midpoint*, $(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

3 Laju purata = $\frac{\text{Jumlah jarak}}{\text{Jumlah masa}}$

Average speed = $\frac{\textit{Total distance}}{\textit{Total time}}$

4 $m = \frac{y_2 - y_1}{x_2 - x_1}$

5 $m = -\frac{\text{pintasan-}y}{\text{pintasan-}x}$

$m = -\frac{y\text{-intercept}}{x\text{-intercept}}$

6 $A^{-1} = \frac{1}{ad - bc}\begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$

SUKATAN DAN GEOMETRI
MEASUREMENT AND GEOMETRY

1 Teorem Pythagoras / *Pythagoras Theorem*, $c^2 = a^2 + b^2$

2 Hasil tambah sudut pedalaman poligon / *Sum of interior angles of a polygon*

$= (n-2)\times 180^\circ$

3 Lilitan bulatan $= \pi d = 2\pi j$

Circumference of circle $= \pi d = 2\pi r$

4 Luas bulatan $= \pi j^2$

Area of circle $= \pi r^2$

5 $\dfrac{\text{Panjang lengkok}}{2\pi j} = \dfrac{\theta}{360^\circ}$

$\dfrac{\textit{Arc length}}{2\pi r} = \dfrac{\theta}{360^\circ}$

6 $\dfrac{\text{Luas sektor}}{\pi j^2} = \dfrac{\theta}{360^\circ}$

$\dfrac{\textit{Area of sector}}{\pi r^2} = \dfrac{\theta}{360^\circ}$

7 Luas lelayang $= \dfrac{1}{2} \times$ hasil darab panjang dua pepenjuru

Area of kite $= \dfrac{1}{2} \times$ *product of two diagonals*

8 Luas trapezium $= \dfrac{1}{2} \times$ hasil tambah dua sisi selari $\times$ tinggi

Area of trapezium $= \dfrac{1}{2} \times$ *sum of two parallel sides* $\times$ *height*

9 Luas permukaan silinder $= 2\pi j^2 + 2\pi jt$

Surface area of cylinder $= 2\pi r^2 + 2\pi rh$

10 Luas permukaan kon $= \pi j^2 + \pi js$

Surface area of cone $= \pi r^2 + \pi rs$

11 Luas permukaan sfera $= 4\pi j^2$

Surface area of sphere $= 4\pi r^2$

12 Isi padu prisma = luas keratan rentas $\times$ tinggi

Volume of prism = area of cross section $\times$ *height*

13 Isi padu silinder $= \pi j^2 t$

Volume of cylinder $= \pi r^2 h$

14 Isi padu kon $= \frac{1}{3}\pi j^2 t$

$Volume\ of\ cone = \frac{1}{3}\pi r^2 h$

15 Isi padu sfera $= \frac{4}{3}\pi j^3$

$Volume\ of\ sphere = \frac{4}{3}\pi r^3$

16 Isi padu piramid = $\frac{1}{3} \times$ luas tapak $\times$ tinggi

$Volume\ of\ pyramid = \frac{1}{3} \times base\ area \times height$

17 Faktor skala, $k = \frac{PA'}{PA}$

$Scale\ factor,\ k = \frac{PA'}{PA}$

18 Luas imej = $k^2 \times$ luas objek

$Area\ of\ image = k^2 \times area\ of\ object$

STATISTIK DAN KEBARANGKALIAN
STATISTICS AND PROBABILITY

1 Min/ *Mean*, $\bar{x} = \frac{\sum x}{N}$

2 Min/ *Mean*, $\bar{x} = \frac{\sum fx}{f}$

3 Varians/ *Variance*, $\sigma^2 = \frac{\sum(x-\bar{x})^2}{N} = \frac{\sum x^2}{N} - \bar{x}^2$

4 Varians/ *Variance*, $\sigma^2 = \frac{\sum f(x-\bar{x})^2}{\sum f} = \frac{\sum fx^2}{\sum f} - \bar{x}^2$

5 Sisihan piawai/ *Standard deviation*, $\sigma = \sqrt{\frac{\sum(x-\bar{x})^2}{N}} = \sqrt{\frac{\sum x^2}{N} - \bar{x}^2}$

6 Sisihan piawai/ *Standard deviation*, $\sigma = \sqrt{\frac{\sum f(x-\bar{x})^2}{\sum f}} = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2}$

7 $P(A) = \frac{n(A)}{n(S)}$

8 $P(A') = 1 - P(A)$

JAWAB SEMUA SOALAN
ANSWER ALL QUESTIONS

1. Bundarkan 0.0080152 betul kepada tiga angka bererti.
Round off 0.0080152 correct to three significant figures.
A. 0.00802 C. 0.00801
B. 0.008015 D. 0.008

2. $3.2 \times 10^8 + 1.05 \times 10^7 =$
A. 3.305×10^{-8} C. 3.305×10^8
B. 4.25×10^{15} D. 4.25×10^1

3. Ungkapkan 0.00000312 dalam bentuk piawai.
Express 0.00000312 in standard form.
A. 3.12×10^6 C. 3.12×10^{-6}
B. 3.12×10^5 D. 3.12×10^{-5}

4. $523_7 + 64_7 =$
A. 502_7 C. 602_7
B. 520_7 D. 620_7

5. Nyatakan nilai digit 4 bagi nombor 2340_5, dalam asas sepuluh.
State the value of 4 for number 2340_5, in base 10.
A. 20 C. 25
B. 100 D. 400

6. Diberi $2(m-k)-\frac{k}{4}=m$,
ungkapkan *m* dalam sebutan *k*.
Given $2(m-k)-\frac{k}{4}=m$,
express m in terms of k.

A. $m = \frac{9k}{7}$ C. $m = \frac{5k}{4}$

B. $m = \frac{12k}{7}$ D. $m = \frac{9k}{4}$

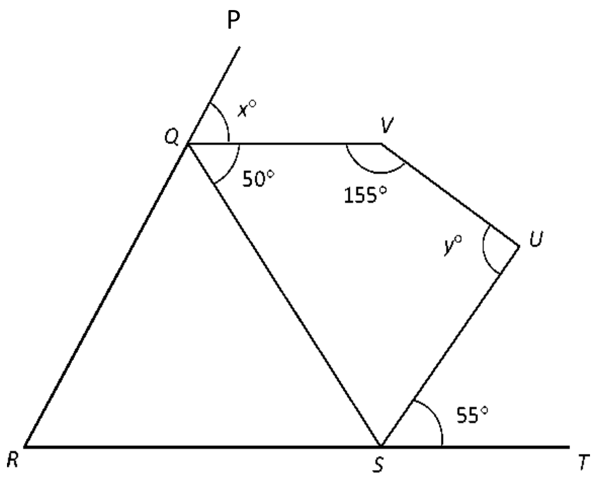
7. Permudahkan:
Simplify:

$$\left(2m^2\right)^3 \times \frac{2mn^2}{4m^2n^{-4}}$$

A. $4m^4n^{-2}$ C. $4m^5n^6$

B. $3m^6n^{-2}$ D. $3m^9n^6$

8. Dalam rajah di bawah, QRS ialah sebuah segitiga sama sisi. PQR dan RST adalah garis lurus.
In the diagram below, QRS is an equilateral triangle. PQR and RST are a straight line.

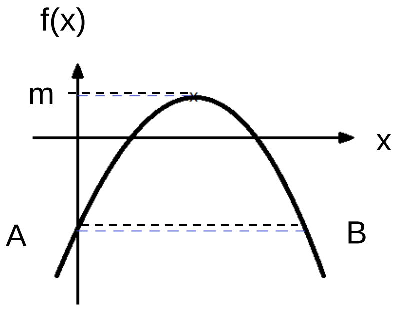


Hitung nilai x + y.
Calculate the value of x + y.

A. 205 C. 165
B. 160 D. 130

9. Rajah di bawah menunjukkan graf fungsi kuadratik $f(x) = -x^2 + 6x - 5$. Garis lurus *AB* adalah selari dengan paksi *x*. Tentukan nilai *m*.

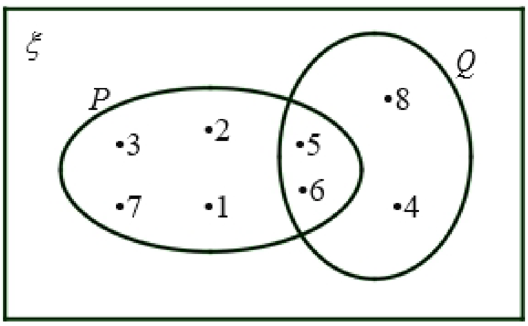
Diagram below shows the graph of the quadratic function $f(x) = -x^2 + 6x - 5$. The straight line AB is parallel with the x-axis. Determine the value of m.



A. 3 C. 15
B. 4 D. 22

10. Rajah di bawah ialah gambar rajah Venn yang menunjukkan set semesta ξ, set P dan set Q.

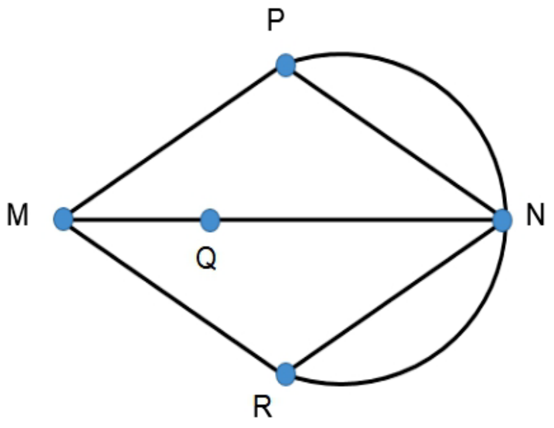
Diagram below is a Venn diagram showing the universal set ξ, set P and set Q.



Cari n(P ∪ Q'). *Find n(P ∪ Q').*

A. 6 C. 5
B. 4 D. 3

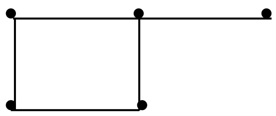
11. Rajah di bawah menunjukkan sebuah graf ganda tak terarah.
Diagram below shows a non-directional double graph.

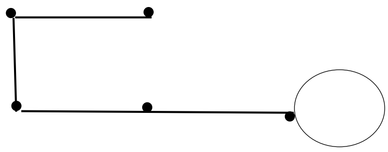


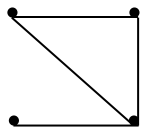
Hitung nilai darjah, d bagi bucu N.
Calculate the value of degree, d for the vertices of N.

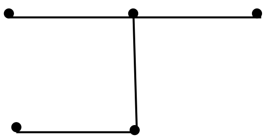
A. 4 C. 10
B. 5 D. 14

12. Antara berikut, yang manakah suatu pokok?
Which of the following is a tree?

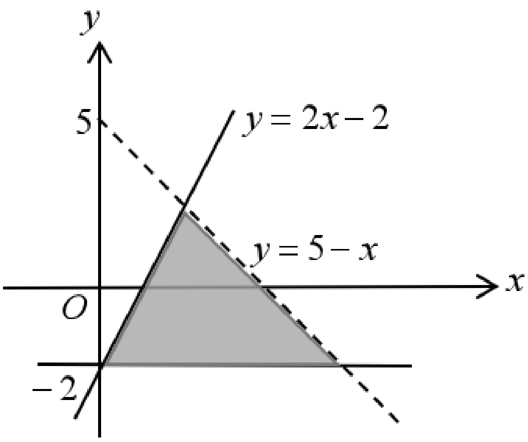
A. 

B. 

C. 

D. 

13. Nyatakan sistem ketaksamaan linear yang mentakrifkan rantau berlorek dalam rajah di bawah.
State the system of linear inequalities which defines the shaded region in the diagram below.



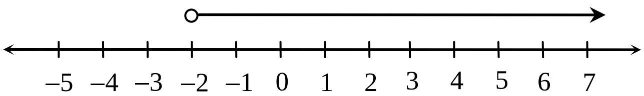
A. $y \leq 2x - 2$, $y > 5 - x$, $y \geq -2$
B. $y \leq 2x - 2$, $y \geq 5 - x$, $y \leq -2$
C. $y \leq 2x - 2$, $y < 5 - x$, $y \geq -2$
D. $y \geq 2x - 2$, $y < 5 - x$, $y \geq -2$

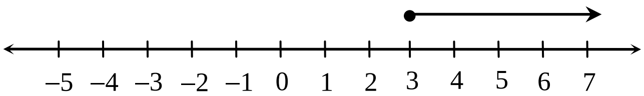
14. Antara berikut yang manakah mewakili penyelesaian bagi ketaksamaan linear serentak

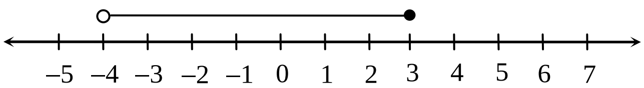
$2x - 3 \leq x$ dan $x + 2 > \frac{x}{2}$?

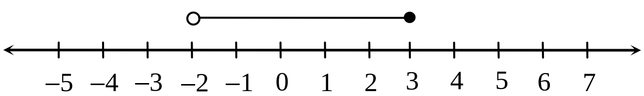
Which of the following represents the solution of the simultaneous linear inequality

$2x - 3 \leq x$ dan $x + 2 > \frac{x}{2}$?

A.


B.


C.


D.


15. Senaraikan semua integer x yang memuaskan kedua-dua ketaksamaan linear serentak,

$4 + x \geq 1$ dan $-\frac{1}{4}x > -1$.

List all the integers x which satisfy both the simultaneous linear inequalities,

$4 + x \geq 1$ and $-\frac{1}{4}x > -1$.

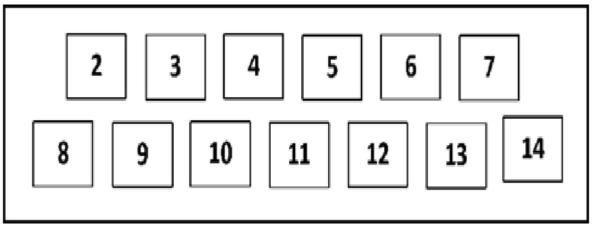
A. –2, –1, 0, 1, 2, 3
B. –2, –1, 0, 1, 2, 3, 4
C. –3, –2, –1, 0, 1, 2, 3
D. –3, –2, –1, 0, 1, 2, 3, 4

16. Kebarangkalian seorang pesakit untuk dijangkiti sejenis virus ialah $\frac{1}{10}$. Dua orang pesakit dipilih secara rawak untuk menjalani saringan pada masa yang sama. Hitung kebarangkalian sekurang-kurangnya seorang pesakit dijangkiti virus itu.
The probability of a patient is infected with a virus $\frac{1}{10}$. Two patients are selected at random to perform the screening at the same time. Calculate the probability that at least one of the patients selected is infected with the virus.

A. $\frac{1}{10}$ C. $\frac{19}{100}$

B. $\frac{9}{50}$ D. $\frac{8}{100}$

17. Rajah di bawah menunjukkan sebilangan kad berlabel di dalam sebuah kotak.
The diagram below shows a number of labeled cards in a box.



Sekeping kad dipilih secara rawak dari kotak itu. Cari kebarangkalian bahawa kad berlabel nombor perdana dipilih.
A piece of card is randomly selected from the box. Find the probability that the card labeled prime number is selected.

A. $\frac{7}{13}$ C. $\frac{8}{13}$

B. $\frac{6}{13}$ D. $\frac{5}{13}$

18. Jadual di bawah menunjukkan bilangan adik-beradik bagi 30 orang murid tingkatan 4A.
The table below shows the number of siblings for 30 students in 4A.

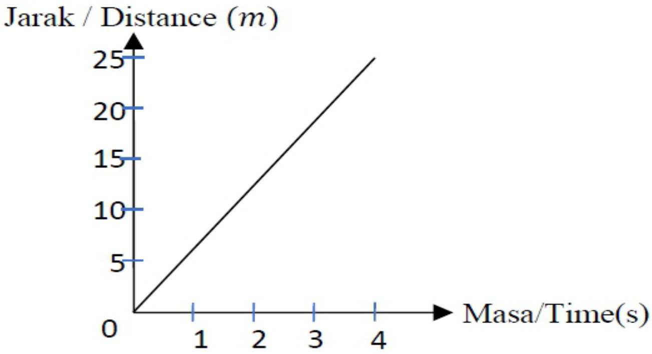
Bil.adik-beradik *No. of siblings*	0	1	2	3	4	5	6
Bil. Murid *No. of students*	2	4	6	3	7	5	3

Tentukan sisihan piawai bagi bilangan adik-beradik murid kelas berkenaan.
Determine the standard deviation for the number of siblings.

A. 1.759 C. 3.2
B. 3.093 D. 3.44

19. Rajah di bawah menunjukkan graf jarak-masa bagi gerakan suatu zarah.

Diagram below shows the distances-time graph for the motion of a particle.



Graf itu menunjukkan zarah itu
The graph shows that particle

A. bergerak semakin laju
is moving faster
B. bergerak semakin perlahan
is moving slower
C. bergerak dengan laju seragam
is moving with a constant speed
D. berada dalam keadaan rehat
is at rest.

20. Antara yang berikut, yang manakah adalah pernyataan BENAR?
Which of the following is a TRUE statement?

A. 4 + 2 = 6 atau/*or* 2 – 2 = 1
B. 4 + 1 = 3 dan/*and* 3 – 5 = –2
C. 2 + 3 = 6 atau/*or* 3 – 2 = 5
D. 2 + 1 = 3 dan/*and* 3 – 1 = 4

21. Rajah di bawah ialah songsangan bagi suatu implikasi.
The diagram below is the inverse of an implication.

Jika 3 bukan faktor bagi 9, maka 9 tidak boleh dibahagi tepat dengan 3. *If 3 is not a factor of 9, then 9 cannot be divided by 3.*

Antara berikut yang manakah adalah kontrapositif bagi implikasi di atas?
Which of the following is the contrapositive of the above implication?

A. Jika 9 tidak boleh dibahagi tepat dengan 3, maka 3 bukan faktor bagi 9.
If 9 cannot be divided by 3, then 3 is not a factor of 9.

B. Jika 3 boleh dibahagi tepat dengan 9, maka 3 ialah faktor bagi 9.
If 3 can be divided by 9, then 3 is a factor of 9.

C. Jika 9 boleh dibahagi tepat dengan 3, maka 3 ialah faktor bagi 9.
If 9 can be divided by 3, then 3 is a factor of 9.

D. Jika 3 tidak boleh dibahagi tepat dengan 9, maka 3 ialah faktor bagi 9.
If 3 cannot be divided by 9 then 3 is a factor of 9.

22. Insurans Am meliputi kesemua yang berikut kecuali
General insurance including all the following except

A. Insurans hayat/*Life insurance*
B. Insurans motor/*Motor insurance*
C. Insurans kebakaran/*Fire insurance*
D. Insurans perjalanan/*Travel insurance*

23. Jadual di bawah ialah pendapatan yang diperoleh oleh Ani.
The table below is Ani's income.

Gaji / *Salary*	RM4500
Komisen / *Commission*	RM820
Sewa diterima / *Rental received*	RM650
Dividen / *Dividend*	RM700

Hitung pendapatan aktif Ani.
Calculate active income of Ani.

A. RM4500 C. RM5970
B. RM5320 D. RM6670

24. Azalea memiliki sebidang tanah berkeluasan 6.5m x 24.9m untuk membina rumah kediaman. Kerajaan negeri menetapkan kadar cukai tanah di kawasan itu pada RM0.40 setiap meter persegi. Berapakah jumlah cukai tanah yang perlu dibayar oleh Azalea setiap tahun?
Azalea owns a piece of land measuring 6.5m x 24.9m to build a residential house. The state government has set the quit rent rate in the area at RM0.40 per square meter. How much quit tax does Azalea have to pay each year?

A. RM64.74 C. RM12.56
B. RM404.63 D. RM776.88

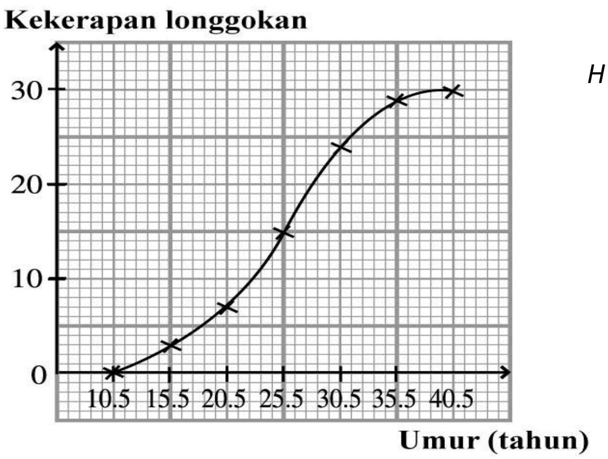
25. Antara yang berikut yang manakah merupakan jenis simpanan.
Which of the following is a type of savings.

A. Saham/*Shares*
B. Amanah saham/*Trust fund*
C. Hartanah/*Real estate*
D. Akaun semasa/*Current account*

26. Apakah kelemahan penggunaan kad kredit?
What is the disadvantage of using credit card?

A. Dapat menikmati sistem ganjaran dalam bentuk wang tunai atau penukaran mata.
Can enjoy a reward system in the form of cash or point redemption.
B. Boleh berbelanja secara berlebihan.
Overspending.
C. Tidak memerlukan kita membawa wang tunai yang banyak.
Does not require us to carry a lot of cash.
D. Kaedah pembayaran yang mudah dan cekap.
Easy and efficient payment method.

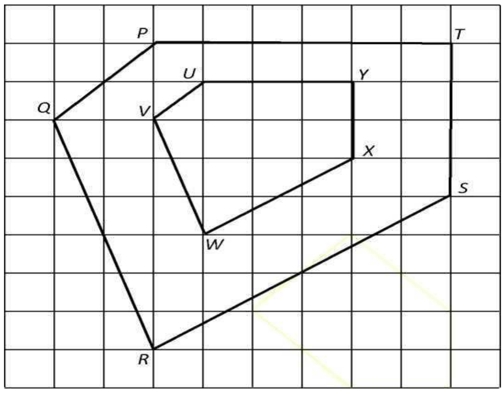
27. Ogif di bawah menunjukkan umur bagi sekumpulan murid.
Ogive below shows the age of a group of students.



Cari median umur.
Find the median of the age.

A. 24.5
B. 25.5
C. 26.5
D. 27.5

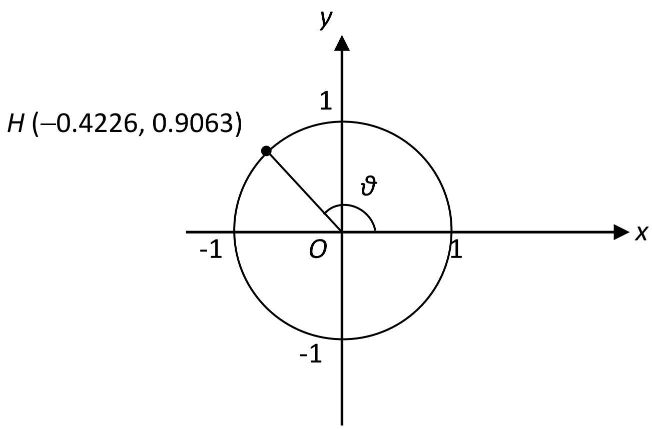
28. Rajah di bawah menunjukkan pentagon PQRST ialah imej bagi pentagon UVWXY di bawah suatu pembesaran dengan faktor skala, k.
Diagram below shows pentagon PQRST is the image of pentagon UVWXY under an enlargement with the scale factor, k.



Apakah nilai k? *What is the value of k?*

A. 3
B. $\frac{1}{2}$
C. 2
D. -2

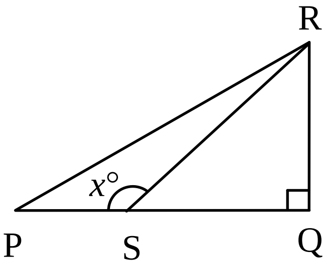
29. Dalam rajah di bawah, O ialah pusat bagi unit bulatan.
In the diagram below, O is the centre of unit circle.



Cari nilai bagi sin θ.
Find the value of sin θ.

A. –0.9063
B. 0.9063
C. –0.4226
D. 2.1446

30. Rajah di bawah menunjukkan segitiga bersudut tegak PQR.
Diagram below shows a right triangle PQR.



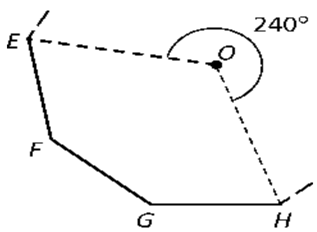
Diberi tan $x° = -\frac{3}{4}$, SQ = 12 cm dan PS = $\frac{1}{2}$SQ.

Given tan $x° = -\frac{3}{4}$, SQ = 12 cm and PS = $\frac{1}{2}$SQ.

Cari panjang, dalam cm bagi PR.
Find length, in cm for PR.

A. 14.32 C. 20.12
B. 18.25 D. 24.03

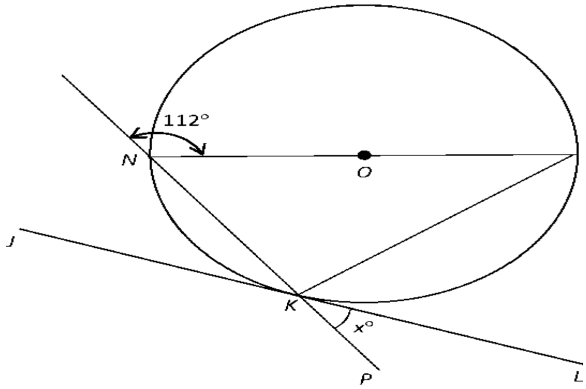
31. Dalam rajah di bawah, E, F, G dan H ialah 4 bucu yang berturutan bagi sebuah poligon sekata. O ialah pusat bagi poligon itu.
In the diagram below, E, F, G, and H are 4 consecutive vertices of a regular polygon. O is the centre of the polygon.



Cari bilangan sisi bagi poligon sekata itu.
Find the number of sides of the regular polygon.

A. 7 C. 8
B. 9 D. 10

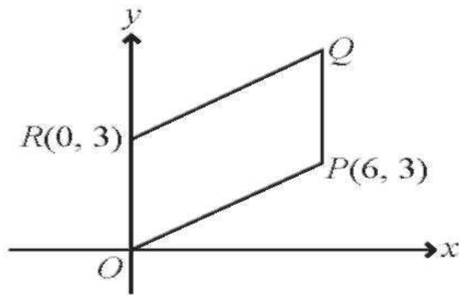
32. Rajah di bawah menunjukkan sebuah bulatan KMN, berpusat O. JKL ialah tangen kepada bulatan itu di titik K. NKP ialah garis lurus dan NOM ialah diameter bulatan.
The diagram below shows a circle KMN, centered O. JKL is the tangent to the circle at point K. NKP is a straight line and NOM is the diameter of the circle.



Cari nilai x.
Find the value of x.

A. 22 C. 44
B. 56 D. 68

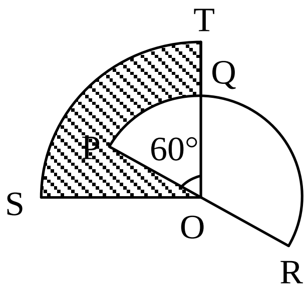
33. Dalam rajah di bawah, *OPQR* ialah sebuah segi empat selari.
In the diagram below, OPQR is a parallelogram.



Cari persamaan garis lurus *QR*.
Find the equation of the straight line QR.

A. y = -2x + 3
B. y = 2x + 3
C. y = $\frac{1}{2}x + 3$
D. y = - $\frac{1}{2}x + 3$

34. Rajah menunjukkan sukuan bulatan OST dan semibulatan PQR, yang kedua-duanya berpusat O.
The diagram shows the quadrant of the circle OST and the semicircle PQR, both of which are centered at O.



Diberi OS = 21 cm, OP = 14 cm.
Given OS = 21 cm, OP = 14 cm.

[Guna/*use* $\pi = \frac{22}{7}$]

Hitung luas, dalam cm^2, kawasan yang berlorek.
Calculate the area, in cm^2, of the shaded area.

A. C.
B. D.

35. Diberi $y \propto \dfrac{1}{(x+2)^n}$ dan y = $\frac{1}{2}$ apabila n = 2 dan x = 2. Cari nilai bagi n apabila y = 1 dan x = 6.
Given $y \propto \dfrac{1}{(x+2)^n}$ *and y =* $\frac{1}{2}$ *when* n *= 2 and x = 2. Find the value of n when y = 1 and x = 6.*

A. 1 C. $\frac{1}{2}$
B. $\frac{1}{8}$ D. 8

36. Jadual di bawah menunjukkan hubungan antara g, h dan f. Diberi g berkadar langsung dengan h dan songsang dengan f.
The table below shows the relationship between g, h and f. Given g is directly proportional to h and inversely proportional to f.

g	h	f
3	x	6
$2\frac{1}{2}$	10	2

Cari nilai bagi x.
Find the value of x.

A. $\frac{1}{2}$ B. 18
C. 25 D. 36

37. $\begin{pmatrix} 3 & -6 \\ 2 & -2 \end{pmatrix} + 3\begin{pmatrix} 1 & -6 \\ 0 & 9 \end{pmatrix} =$

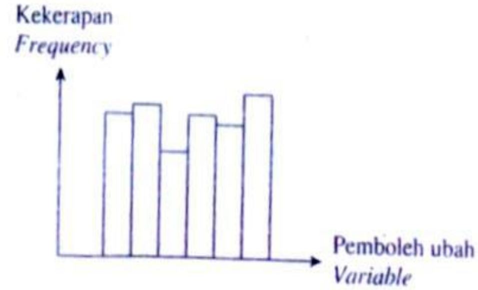
A. $\begin{pmatrix} 3 & -6 \\ 5 & -2 \end{pmatrix}$ C. $\begin{pmatrix} 1 & -12 \\ 2 & -7 \end{pmatrix}$
B. $\begin{pmatrix} 6 & -12 \\ 2 & 29 \end{pmatrix}$ D. $\begin{pmatrix} 6 & -24 \\ 2 & 25 \end{pmatrix}$

38. Selesaikan/solve $\begin{pmatrix} 6 & -24 \\ 2 & 25 \end{pmatrix}\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

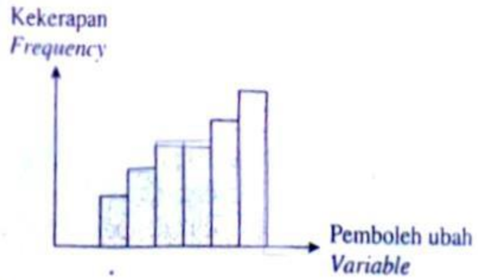
A. $\begin{pmatrix} 6 & 3 \\ 2 & -2 \end{pmatrix}$ C. $\begin{pmatrix} 2 & -2 \\ 2 & -7 \end{pmatrix}$
B. $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ D. $\begin{pmatrix} 6 & -24 \\ 2 & 25 \end{pmatrix}$

39. Histogram manakah mempunyai bentuk taburan pencong ke kanan?
Which histogram has a distribution shape of right-skewed?

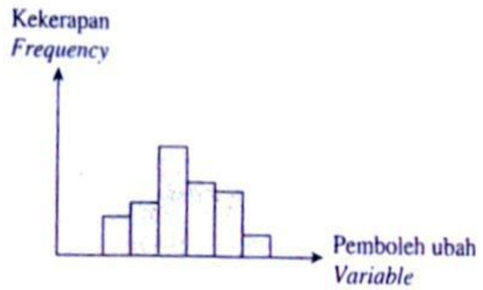
A



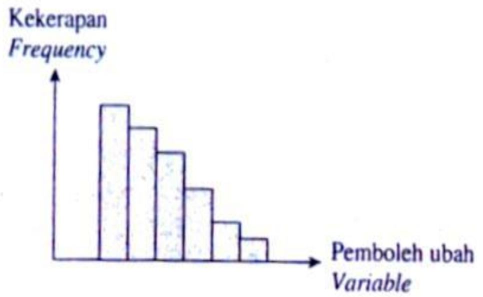
B



C



D



40. Jadual di bawah menunjukkan harga bagi makanan dalam sebuah restoran.
The table below shows the prices of food in a restaurant.

Makanan ***Food***	**Harga Per Pinggan (RM)** ***Price Per Plate (RM)***
Nasi ayam *Chicken rice*	7.00
Nasi lemak *Nasi lemak*	4.00
Mi goreng *Fried noodles*	5.00

Keluarga Encik Chai telah memesan tiga pinggan nasi ayam, sepinggan nasi lemak dan dua pinggan mi goreng. Diberi bahawa restoran itu mengenakan cukai perkhidmatan 6%. Berapakah jumlah amaun yang perlu dibayar oleh Encik Chai?
Mr. Chai's family has ordered three plates of chicken rice, a plate of nasi lemak and two plates of fried noodles. Given that the restaurant charges a 6% service tax. What is the total amount that Mr. Chai has to pay?

A. RM35.00
B. RM37.10
C. RM38.50
D. RM39.40

KERTAS SOALAN TAMAT/ *END OF QUESTION PAPER*

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